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Feed Dairy Cows Liberally

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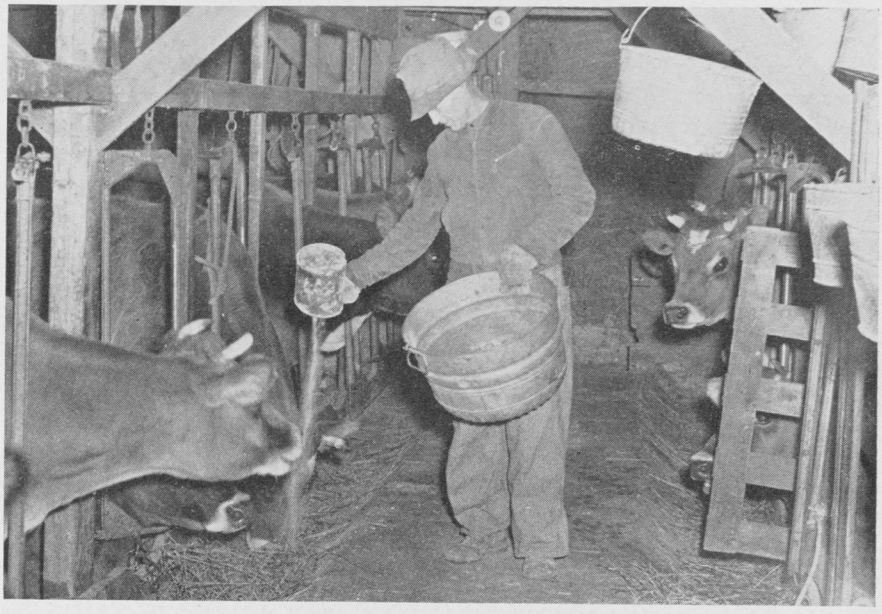
WITH FEED AND BUTTERFAT prices as they are now, it pays a dairyman mighty well to feed grain liberally. As long as butterfat stays at near 50 cents a pound and the price of balanced grain feeds remains at near $35 a ton, a dairy farmer should feed grain liberally. It is patriotic as well as profitable in our food for freedom war effort.

We conducted some experiments here at the Iowa Station from 1938 to 1940 to try to find out whether it was profitable to feed grain, or whether roughage alone might be more profitable, even though production would be less.

In that period it would have paid farmers to feed at least a limited grain ration to their dairy cows, but the prices were not as favorable for grain feeding as now. Our tests indicated, however, that if butterfat should drop to say 25 cents a pound while grain remained around $30 a ton and hay at $10, dairy farmers might find it wise to decrease the amount of grain fed or eliminate it entirely.

So the dairyman needs some kind of "profit-detector" to determine when it is profitable to feed grain. Our tests show that a balanced grain mixture can be fed to cows profitably if 100 pounds of this mixture does not cost more than 3½ times the price of butterfat plus the value of 100 pounds of hay. For example, if butterfat is worth 50 cents per pound and alfalfa hay is worth $10 per ton, then the farmer can afford to pay as high as $2.25 for each 100 pounds of his balanced grain mixture without losing money (3½ times 50 cents, the price of butterfat, equals $1.75, to which is added 50 cents, the price of 100 pounds of hay—this totals $2.25). If the farmer had to pay more than $2.25 for each 100 pounds of grain mixture under these conditions, he would lose money. If he could buy it for less, his profit would be equal to the difference between the price he pays for the grain and $2.25, which is the highest profitable price that can be paid under these conditions.



They Will Make Profitable Use of Grain With Feed and Butterfat Prices at Present Levels

In our feeding trials one group of cows was fed roughage alone, a second group was fed roughage plus a limited grain ration (1 pound of grain for each 8 pounds of milk produced), while a third group was fed roughage plus a full amount of grain (1 pound of grain for every 4 pounds of milk produced). We found that cows can be expected to increase their milk yield 15 percent when they are shifted from a straight roughage diet to a ration including roughage and a limited grain mixture. When the cows are fed a full amount of grain, they can be expected to increase their milk yield a little more than 25 percent over feeding roughage alone.

One of the important results we noticed was that when the cows were fed roughage alone, their total consumption of feed was not as large as when grain was added to the rations. The cows were not as thrifty looking as the grain-fed cows and most of them lost weight, indicating that they were using body reserves in sustaining milk production.

If one knows the increases that can be expected when grain is fed, it is a relatively simple matter to calculate whether it is profitable to feed grain or not. Just be sure that the extra returns in milk production at least equal the added cost of grain in the ration.

Our tests were made in two separate trials. In the first trial 15 Holstein cows were divided into three groups of five cows each, the groups being similar in age, size, stage of lactation and production. The experiment ran through 3 periods of 7 weeks each, and was of the double switch-back type. The first group received a ration of roughage alone for the first period. The second group received roughage plus a limited amount of grain. During the second 7-weeks' period the rations of these two groups were reversed, and for the third period they were returned to their

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original respective rations. The third group of cows served as a check on the other two groups and received a ration of roughage plus a full amount of grain throughout the experiment.

The second year a new design was devised in which 18 Holstein cows were used in the investigation. These cows were divided into six groups of three cows each, the animals in each group being selected with as much uniformity as possible in age, size, stage of lactation and production. The experiment consisted of three 6-week periods with 1 week out between periods to adjust the cows' rations.

The system in this trial was such that each cow in each group received a different ration during each period. The rations fed this second year were quite similar to those of the first year. They consisted of roughage alone, roughage plus a limited amount of grain (1 pound of grain to each 7 pounds of milk produced), and roughage plus a full amount of grain (1 pound of grain to each 3½ pounds of milk produced). These rations were fed in different order to each group so that each ration was preceded in its feeding order by every other ration an equal number of times throughout the trial. This was done to evaluate the carry-over effects of nutrient consumption on milk production which might occur in changing from one ration to another.

Farmers who look for immediate responses to changes in rations will do well to remember that such responses do not come quickly. It takes time, for instance, for a cow which has been fed roughage alone to increase her milk yield once you begin to feed her grain. Part of the grain must be used by that cow to restore the reserves in her body which have been removed to sustain the flow of milk during the time she was fed only roughage. On the other hand, a cow will continue to produce at a relatively high level after grain is dropped from her ration because she will use her body reserves to keep up the flow of milk.

Inoculate Your Soybeans

Survey Indicates One Field in Four or Five Is Not Inoculated or Is Not Inoculated Properly

By A. G. NORMAN

IT'S NOT POSSIBLE to say that inoculating your soybean seed will increase the yield you will get by 3 or 6 or more bushels an acre or by a definite percentage because fertility varies so much from field to field. But the experience of many farmers and many experiment station tests indicate that inoculation is well worth the small cost and may bring substantial returns.

A dime the past year would purchase enough inoculant to treat a bushel of seed, and the price will probably be about the same in 1943. Obviously it does not take much of an increase in yield to pay for the inoculant and the relatively little time it takes to inoculate seed.

We know that a good many Iowa farmers consider inoculation of soybean seed good cheap insurance and they make it a rule to inoculate all their seed. But a few farmers are still not convinced of the value of nodule bacteria in supplementing the supply of nitrogen which beans are able to get from the soil. And so these few farmers do not inoculate.

Then there are some farmers who inoculate their beans when planting on new land but do not re-inoculate if they know that beans have previously been grown on any particular field. They assume that sufficient bacteria will live over in the soil to bring about proper nodulation. While this is often the case, it may not always be so because the soybean nodule bacteria are "weak sisters"—they're not particularly vigorous when free-living in the soil. Under such circumstances they have to compete for food with the better-adapted organisms that are always in the soil, and may slowly die out.

TOTAL ACREAGE IN SOYBEANS

	1937	1938	1939
Hardin County	7,509	11,157	17,904
Monona County	343	675	1,128
	1940	**1941**	**1942**
Hardin County	20,589	13,661*	27,896*
Monona County	2,032	3,277*	22,000*

*Estimate made by County AAA officers, others from assessors' records.

No one has had any very definite information as to the percentage of beans inoculated at the time of planting or, what is perhaps more important, as to the actual amount of nodulation to be found in the field in Iowa. Estimates of the latter made by persons in a good position to express an opinion on this subject have ranged all the way from one-third to nearly 100 percent of the fields.

In order to obtain a more satisfactory answer to this question the Iowa Station made a survey this past season in two counties, Hardin and Monona. We restricted the survey to the bottomland townships of Monona County because almost all the beans are found there. Both counties had a substantial acreage of beans in 1942, but they differed markedly in past history. In Hardin County the soybean acreage has expanded for the past 5 years, whereas in Monona County soybeans are almost a new crop.

Accordingly, nodulation would only be general in Monona County if the seed was inoculated in 1942. In Hardin County, on the other hand, many of the fields must have